

Design of Prototype-Technology Evaluator and Research Aircraft (PTERA) Configuration for Loss of Control Flight Research, Phase I

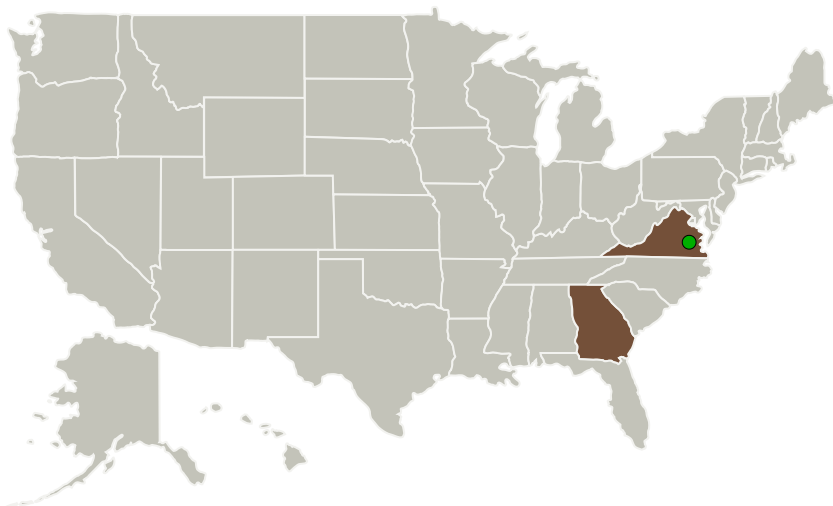
Completed Technology Project (2012 - 2012)



Project Introduction

The Area-I team has developed and fabricated the unmanned Prototype-Technology Evaluation and Research Aircraft or PTERA ("ptera" being Greek for wing, or wing-like). The PTERA is an extremely versatile and high-quality, yet inexpensive flight research testbed that serves as a bridge between wind tunnel and manned flight testing by enabling the low-cost, low-risk flight-based evaluation of a wide array of high-risk technologies. For this work, the team proposes to augment the existing PTERA platform such that it is directly tailored for Loss-of-Control (LoC) flight research. The resulting PTERA-LoC configuration will provide the NASA LoC flight research program with the following core capabilities: 1) A large airframe that minimizes scaling and Reynolds number effects, yet is easily disassembled and transported 2) A modular fuselage design that will enable the reconfiguration of the PTERA-LoC fuselage, thus allowing the team to fabricate/assemble fuselage configurations that maintain near geometric similitude with a wide array of "tube-and-wing" aircraft using existing fuselage tooling. 3) Modular wing design that facilitates the integration of advanced aerodynamic treatments, split control surfaces, and aeroelastic and damage emulation mechanisms. 4) Large payload capacity, voluminous payload bays, and large clamshell doors that facilitate the integration of sensor and avionics systems, provide easy access during flight testing, and allow for plenty of payload capacity and volume for integrating ballast for dynamic scaling. 5) A low-cost airframe that facilitates the execution of flight test maneuvers and/or the flight testing of cutting-edge and complex systems whose risks and/or costs are too high for manned flights

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Area-I, Inc.	Lead Organization	Industry	Kennesaw, Georgia
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
Georgia	Virginia

Project Transitions

February 2012: Project Start

August 2012: Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140684>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Area-I, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

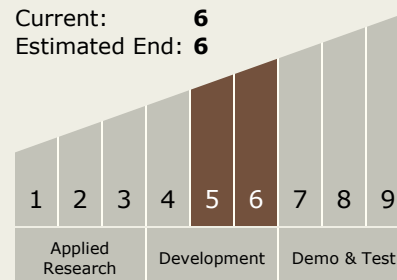
Carlos Torrez

Principal Investigator:

Nicholas R Alley

Technology Maturity (TRL)

Start: 5
Current: 6
Estimated End: 6



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Technology Areas

Primary:

- TX15 Flight Vehicle Systems
 - └ TX15.2 Flight Mechanics
 - └ TX15.2.3 Flight Mechanics Testing and Flight Operations

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System